AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

What is claimed is:

1. (Original) A method for mechanically assisting the pumping action of the heart, comprising the steps of :

providing a catheter comprising an elongate member having a proximal end, a distal region, the catheter further comprising an expandable member attached in the distal region and an inflatable member in the distal region and attached distal the expandable member, the catheter further comprising a lumen that communicates with the inflatable member and extends proximally;

advancing the distal end of the catheter into the aorta;

expanding the expandable member to at least partially obstruct the aorta;

inflating the inflatable member during diastole; and

deflating the inflatable member during the ejection phase of the left ventricle, wherein the pumping action of the heart is mechanically assisted.

2. (Original) The method of claim 1, wherein the inflatable member has a volume of between 10–30 cc.

3. (Original) The method of claim 1, wherein the expandable member is maintained in an expanded state during systole and diastole.

4. (Original) The method of claim 1, wherein the expandable member is cycled between an expanded state and a contracted state.

5. (Original) The method of claim 1, wherein the expandable member is expanded before inflating the inflatable member, and wherein the expandable member is contracted after deflating the inflatable member.

6. (Original) The method of claim 1, further comprising the steps of repeating the steps of inflating the inflatable member and deflating the inflatable member.

7. (Original) The method of claim 5, further comprising the steps of repeating the steps of inflating the inflatable member and deflating the inflatable member.

8. (Original) The method of claim 1, wherein the catheter is placed so that the inflatable member and the expandable member are positioned in the descending aorta.

9. (Original) The method of claim 1, wherein the inflatable member is inflated with carbon dioxide.

10. (Original) The method of claim 1, wherein the expandable member is a balloon.

11. (Original) The method of claim 10, wherein the balloon is expanded by filling with saline.

12. (Original) The method of claim 10, wherein the balloon is expanded by filling with carbon dioxide.

13. (Original) The method of claim 1, wherein the expandable member is expanded to fully obstruct the aorta.

14. (Original) The method of claim 1, wherein the expandable member is expanded to partially obstruct the aorta.

15. (Original) The method of claim 1, further comprising the steps of measuring an electrocardiogram and synchronizing inflation with the R wave of the electrocardiogram, so that maximum inflation occurs at the peak of the T wave, and deflation is timed to occur just before the next QRS complex of the electrocardiogram.

16. (Original) The method of claim 1, wherein cerebral blood flow is augmented by the combined action of the inflatable member and the expandable member.

17-28. (Cancelled)

29. A method for mechanically assisting the pumping action of the heart, comprising the steps of:

providing a catheter having a proximal end, a distal end, a distal region, a first balloon attached in the distal region, a second balloon attached in the distal region distal the first balloon, and a third balloon attached in the distal region distal the second balloon;

advancing the distal end of the catheter into the aorta;

sequentially inflating the first balloon, the second balloon, and the third balloon during diastole, to propagate blood flow retrograde to the coronary arteries and the carotid arteries; and

sequentially deflating the third balloon, the second balloon, and the first balloon during the ejection phase of the left ventricle to propagate blood flow antegrade, wherein the pumping action of the heart is mechanically assisted.

30-48. (Cancelled)

49. (Original) A method for mechanically assisting the pumping action of the heart, comprising the steps of :

providing a catheter comprising an elongate member having a proximal end, a distal region, the catheter further comprising an expandable member attached in the distal region and an inflatable member in the distal region and attached proximal the expandable member, the catheter further comprising a lumen that communicates with the inflatable member and extends proximally;

inserting the catheter into a subclavian artery;

advancing the distal end of the catheter into the aorta;

expanding the expandable member to at least partially obstruct the aorta;

inflating the inflatable member during diastole; and

deflating the inflatable member during the ejection phase of the left ventricle, wherein the pumping action of the heart is mechanically assisted.

50-73. (Cancelled)

74. (New) The method of claim 29, wherein the catheter further comprises a fourth balloon attached in the distal region distal the third balloon.

75. (New) The method of claim 74, wherein the catheter further comprises a fourth balloon attached in the distal region distal the third balloon.

76. (New) The method of claim 29, wherein the first, second, and third balloons are inflated with a gas.

77. (New) The method of claim 76, wherein the gas is carbon dioxide.

78. (New) The method of claim 29, wherein the first, second, and third balloons have a volume of between 10–30 cc.

79. (New) The method of claim 29, further comprising the step of repeating the steps of sequentially inflating the first, second, and third balloons and sequentially deflating the third, second, and first balloons.

80. (New) The method of claim 29, wherein the catheter is placed so that the first, second, and third balloons are positioned in the descending aorta.

81. (New) The method of claim 29, wherein the first, second, and third balloons are inflated to fully obstruct the aorta.

82. (New) The method of claim 29, wherein the first, second, and third balloons are inflated to partially obstruct the aorta.

83. (New) The method of claim 29, further comprising the steps of measuring an electrocardiogram and synchronizing inflation of the balloons with the R wave of the electrocardiogram, so that maximum inflation occurs at the peak of the T wave, and deflation of the balloons is timed to occur just before the next QRS complex of the electrocardiogram.

84. (New) The method of claim 49, wherein the inflatable member has a volume of between 10–30 cc.

85. (New) The method of claim 49, wherein the expandable member is maintained in an expanded state during systole and diastole.

86. (New) The method of claim 49, wherein the expandable member is cycled between an expanded state and a contracted state.

87. (New) The method of claim 49, wherein the expandable member is expanded before inflating the inflatable member, and wherein the expandable member is contracted after deflating the inflatable member.

88. (New) The method of claim 49, further comprising the steps of repeating the steps of inflating the inflatable member and deflating the inflatable member.

89. (New) The method of claim 88, further comprising the steps of repeating the steps of inflating the inflatable member and deflating the inflatable member.

90. (New) The method of claim 49, wherein the catheter is placed so that the inflatable member and the expandable member are positioned in the descending aorta.

91. (New) The method of claim 49, wherein the inflatable member is inflated with carbon dioxide.

92. (New) The method of claim 49, wherein the expandable member is a balloon.

93. (New) The method of claim 58, wherein the balloon is expanded by filling with saline.

94. (New) The method of claim 58, wherein the balloon is expanded by filling with carbon dioxide.

95. (New) The method of claim 49, wherein the expandable member is expanded to fully obstruct the aorta.

96. (New) The method of claim 49, wherein the expandable member is expanded to partially obstruct the aorta.

97. (New) The method of claim 49, further comprising the steps of measuring an electrocardiogram and synchronizing inflation with the R wave of the electrocardiogram, so that maximum inflation occurs at the peak of the T wave, and deflation is timed to occur just before the next QRS complex of the electrocardiogram.

98. (New) The method of claim 49, wherein cerebral blood flow is augmented by the combined action of the inflatable member and the expandable member.

99. (New) The method of claim 49, further comprising the step of measuring a physiologic parameter and adjusting the expansion of the expandable member based on the measured physiologic parameter.

100. (New) The method of claim 99, wherein the physiologic parameter is blood pressure measured at a location upstream the expandable member and/or downstream the expandable member.

101. (New) The method of claim 99, wherein the physiologic parameter is cerebral blood flow.

102. (New) The method of claim 96, wherein the expandable member is expanded to cause an 80 percent obstruction of the aortic lumen.

103. (New) The method of claim 49, wherein the inflatable member is inflated with a gas.

104. (New) The method of claim 49, wherein the expandable member is cycled in a manner that is timed with the cardiac cycle.

105. (New) The method of claim 86, wherein the expandable member is cycled in a manner that is timed with the cardiac cycle.

106. (New) The method of claim 92, wherein the expandable member is a volume displacement member.

107. (New) The method of claim 1, further comprising the step of measuring a physiologic parameter and adjusting the expansion of the expandable member based on the measured physiologic parameter.

108. (New) The method of claim 17, wherein the physiologic parameter is blood pressure measured at a location upstream the expandable member and/or downstream the expandable member.

109. (New) The method of claim 17, wherein the physiologic parameter is cerebral blood flow.

110. (New) The method of claim 14, wherein the expandable member is expanded to cause an 80 percent obstruction of the aortic lumen.

111. (New) The method of claim 1, wherein the inflatable member is inflated with a gas.